

Chem 167 Quiz 3 Answer Key Answer Key PDF

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What is the charge of an electron?

- A. +1
- B. 0
- C. -1 ✓**
- D. +2

Which of the following are properties of metals?

- A. High electrical conductivity ✓**
- B. brittle
- C. Malleable ✓**
- D. Poor thermal conductivity

Explain why noble gases are generally unreactive.

Noble gases are unreactive because they have a full valence shell of electrons, making them stable and unlikely to form chemical bonds.

Which element is a halogen?

- A. Oxygen
- B. Chlorine ✓**
- C. Sodium
- D. Argon

Which of the following are examples of physical changes?

- A. Melting of ice ✓**
- B. RustING of iron

C. Dissolving sugar in water ✓

D. BurnING of wood

Describe the difference between a homogeneous and a heterogeneous mixture.

A homogeneous mixture has a uniform composition throughout, while a heterogeneous mixture has a non-uniform composition with distinct phases or layers.

What is the primary component of air?

A. Oxygen

B. Carbon dioxide

C. Nitrogen ✓

D. Argon

Which of the following are characteristics of ionic compounds?

A. High melting points ✓

B. Conduct electricity when dissolved in water ✓

C. Low boiling points

D. FormED by sharing electrons

Explain the significance of Avogadro's number in chemistry.

Avogadro's number (6.022×10^{23}) is the number of atoms, ions, or molecules in one mole of a substance, allowing chemists to count particles by weighing them.

Which gas law relates pressure and volume at constant temperature?

A. Charles's Law

B. Boyles's Law ✓

C. Avogadro's Law

D. Dalton's Law

Which of the following are true about acids?

A. They taste sour ✓

- B. They turn blue litmus paper red ✓**
- C. They have a pH greater than 7
- D. They react with bases to form water and salt ✓**

Discuss the role of catalysts in chemical reactions and provide an example.

Catalysts speed up chemical reactions by lowering the activation energy without being consumed in the process. An example is the use of platinum in catalytic converters to speed up the conversion of exhaust gases.

Which type of intermolecular force is the strongest?

- A. London dispersion forces
- B. Dipole-dipole interactions
- C. Hydrogen bonding ✓**
- D. Van der Waals forces

Which of the following are true for endothermic reactions?

- A. Absorb heat from the surroundings ✓**
- B. Have a positive ΔH ✓**
- C. Release heat to the surroundings
- D. Have a negative ΔH

Explain how the periodic table is organized and how this organization helps predict the properties of elements.

The periodic table is organized by increasing atomic number, with elements in the same group having similar chemical properties due to similar valence electron configurations. This organization helps predict reactivity, bonding, and other properties.

Which of the following best describes a buffer solution?

- A. A solution that changes pH easily
- B. A solution that resists changes in pH ✓**
- C. A solution with a pH of 7
- D. A solution that is highly acidic

Which of the following are examples of chemical changes?

- A. BurnING of wood ✓
- B. Melting of ice
- C. RustING of iron ✓
- D. Boiling of water

Describe the process of electron configuration and its importance in understanding chemical behavior.

Electron configuration describes the distribution of electrons in an atom's orbitals. It is important for understanding chemical behavior because it determines how atoms interact, bond, and react with other atoms.

Which of the following best describes an amphoteric substance?

- A. A substance that is only acidic
- B. A substance that is only basic
- C. A substance that can act as both an acid and a base ✓
- D. A substance that is neither acidic nor basic

Which of the following are colligative properties?

- A. Boiling point elevation ✓
- B. Freezing point depression ✓
- C. Vapor pressure lowering ✓
- D. Density

Explain the concept of molarity and how it is used to express the concentration of a solution.

Molarity is the number of moles of solute per liter of solution. It is used to express concentration because it provides a way to quantify the amount of solute in a given volume of solution, which is important for stoichiometric calculations in reactions.

Which of the following best describes a polar covalent bond?

- A. Electrons are shared equally between atoms
- B. Electrons are transferred from one atom to another

C. Electrons are shared unequally between atoms ✓

D. Electrons are not involved in bonding

Which of the following factors can increase the solubility of a solid in a liquid?

A. Increasing temperature ✓

B. Decreasing temperature

C. Stirring the solution ✓

D. Increasing pressure

Discuss the significance of the law of conservation of mass in chemical reactions.

The law of conservation of mass states that mass is neither created nor destroyed in a chemical reaction. This principle is significant because it ensures that the mass of reactants equals the mass of products, allowing for accurate stoichiometric calculations.

Which of the following best describes a covalent network solid?

A. A solid with metallic bonds

B. A solid with ionic bonds

C. A solid with a continuous network of covalent bonds ✓

D. A solid with weak intermolecular forces

Which of the following are true about bases?

A. They taste bitter ✓

B. They turn red litimous paper blue ✓

C. They have a pH less than 7

D. They feel slippery ✓

Explain how the concept of electronegativity is used to predict the polarity of a molecule.

Electronegativity is the tendency of an atom to attract electrons in a bond. By comparing the electronegativities of atoms in a molecule, one can predict whether the electrons are shared equally (nonpolar) or unequally (polar), determining the molecule's polarity.